

## Claims

I claim:

1. A Collection Extensible Action GUI process for executing a GUI action, comprising the following steps:
  - (a) receiving an action execution request, and
  - (b) performing an action execution response to said action execution request,thereby providing a solution to the Collection Extensible Action GUI Problem, and  
  
thereby providing human users with a practical means for extending the functionality of graphical user interfaces in a way that was not previously possible.
2. The process of claim 1, wherein
  - (a) said step of receiving an action execution request receives an action execution request from a source selected from the group consisting of human operators and external programs and a GUI program that is executing said step of receiving an action execution request,thereby helping to solve the Collection Extensible Action GUI Problem, and  
  
thereby providing GUI interfaces with a practical means for responding to action execution requests that originate from both inside and outside the GUI program.
3. The process of claim 1, wherein
  - (a) said step of performing an action execution response obtains an action

identifier from said action execution request,

thereby helping to solve the Collection Extensible Action GUI Problem, and

thereby providing a practical means for clearly identifying a particular action to be executed as part of said action execution response

4. The process of claim 1, wherein

(a) said step of performing an action execution response uses an action identifier, and action data read from an action data storage means, to perform a name matching operation to identify an action definition to be executed,

thereby helping to solve the Collection Extensible Action GUI Problem, and the Customized Action Problem, and the Sharable Action Problem, and the Scalable Action Storage Problem,

and thereby providing a practical means for identifying a particular action definition to be executed as part of said action execution response.

5. The process of claim 1, wherein

(a) said step of performing an action execution response uses action definition data read from an action data storage means to perform said action execution response,

thereby helping to solve the Collection Extensible Action GUI Problem, and the Customized Action Problem, and the Sharable Action Problem, and the Scalable Action Storage Problem,

and thereby providing a practical means for obtaining an action definition to be executed as part of said action execution response.

6. The process of claim 1, wherein

(a) said step of performing an action execution response uses action definition data read from a context-sensitive action data storage means to perform said action execution response,

thereby helping to solve the Collection Extensible Action GUI Problem, and the Customized Action Problem, and the Sharable Action Problem, and the Scalable Action Storage Problem,

and thereby providing a practical means for obtaining in a context-sensitive way an action definition to be executed as part of said action execution response.

7. The process of claim 1, wherein

(a) said step of performing an action execution response obtains an action type indicator from an action definition,

thereby helping to solve the Sequenced Action Problem,

and thereby providing a practical means for identifying single actions and group actions as part of said action execution response.

8. The process of claim 1, wherein

(a) said step of performing an action execution response executes an action whose type is selected from the group consisting of single actions and group

actions,

thereby helping to solve the Sequenced Action Problem,

and thereby providing a practical means for executing single actions and group actions as part of said action execution response.

9. The process of claim 1, wherein

(a) said step of performing an action execution response uses action data read from an action data storage means to perform said action execution response,

thereby helping to solve the Collection Extensible Action GUI Problem, and the Customized Action Problem, and the Sharable Action Problem, and the Scalable Action Storage Problem,

and thereby providing a practical means for obtaining action data to use during the performance of said action execution response.

10. The process of claim 1, wherein

(a) said step of performing an action execution response uses action data read from a context-sensitive action data storage means to perform said action execution response,

thereby helping to solve the Collection Extensible Action GUI Problem, and the Customized Action Problem, and the Sharable Action Problem, and the Scalable Action Storage Problem,

and thereby providing a practical means for obtaining in a context-sensitive way action data to use during the performance of said action execution response.

11. The process of claim 1, wherein

(a) said step of performing an action execution response executes a single action,

thereby helping to solve the Collection Extensible Action GUI Problem,

and thereby providing a practical means for executing single actions as part of said action execution response.

12. The process of claim 1, wherein

(a) said step of performing an action execution response executes a group action,

thereby helping to solve the Collection Extensible Action GUI Problem, and the Sequenced Action Problem,

and thereby providing a practical means for executing group actions and single actions as part of said action execution response.

13. The process of claim 1, wherein

(a) said step of performing an action execution response executes a single action using a parallel execution technique,

thereby solving the Single Action Parallel Execution Problem,

and thereby providing a practical means for improving the execution performance of single actions executed as part of said action execution response.

14. The process of claim 1, wherein

(a) said step of performing an action execution response executes a group action using a parallel execution technique,

thereby solving the Group Action Parallel Execution Problem,

and thereby providing a practical means for improving the execution performance of group actions executed as part of said action execution response.

15. The process of claim 1, wherein

(a) said step of performing an action execution response uses zero or more focus variable substitutions to construct an executable action command,

thereby solving the Parameterized Action Problem,

and thereby providing a practical means for inserting current parameter values into an action command template as part of said action execution response.

16. The process of claim 1, wherein

(a) said step of performing an action execution response uses a dynamic list to construct an action dialog,

thereby solving the Dynamic List Generation Problem,

and thereby providing a practical means for inserting lists of current data values into an action dialog as part of said action execution response.

17. The process of claim 1, wherein

(a) said step of performing an action execution response communicates action execution results to one or more destinations selected from the group consisting of computer memories and computer display screens and computer files and computer networks,

thereby helping to solve the Collection Extensible Action GUI Problem,

and thereby providing a practical means for displaying and storing action execution results as part of said action execution response.

18. A programmable Collection Extensible Action GUI device for executing a GUI action, whose actions are directed by software executing a process comprising the following steps:

(a) receiving an action execution request, and

(b) performing an action execution response to said action execution request,

thereby providing a solution to the Collection Extensible Action GUI Problem, and

thereby providing human users with a practical means for extending the functionality of graphical user interfaces in a way that was not previously possible.

19. The programmable device of claim 18, wherein

(a) said step of receiving an action execution request receives an action execution request from a source selected from the group consisting of human operators and external programs and a GUI program that is executing said step of receiving an action execution request,

thereby helping to solve the Collection Extensible Action GUI Problem, and

thereby providing GUI interfaces with a practical means for responding to action execution requests that originate from both inside and outside the GUI program.

20. The programmable device of claim 18, wherein

(a) said step of performing an action execution response obtains an action identifier from said action execution request,

thereby helping to solve the Collection Extensible Action GUI Problem, and

thereby providing a practical means for clearly identifying a particular action to be executed as part of said action execution response.

21. The programmable device of claim 18, wherein

(a) said step of performing an action execution response uses an action identifier, and action data read from an action data storage means, to perform a name matching operation to identify an action definition to be executed,

thereby helping to solve the Collection Extensible Action GUI Problem, and the Customized Action Problem, and the Sharable Action Problem, and the Scalable Action Storage Problem,



and thereby providing a practical means for identifying a particular action definition to be executed as part of said action execution response.

22. The programmable device of claim 18, wherein

(a) said step of performing an action execution response uses action definition data read from an action data storage means to perform said action execution response,

thereby helping to solve the Collection Extensible Action GUI Problem, and the Customized Action Problem, and the Sharable Action Problem, and the Scalable Action Storage Problem,

and thereby providing a practical means for obtaining an action definition to be executed as part of said action execution response.

23. The programmable device of claim 18, wherein

(a) said step of performing an action execution response uses action definition data read from a context-sensitive action data storage means to perform said action execution response,

thereby helping to solve the Collection Extensible Action GUI Problem, and the Customized Action Problem, and the Sharable Action Problem, and the Scalable Action Storage Problem,

and thereby providing a practical means for obtaining in a context-sensitive way an action definition to be executed as part of said action execution response.

24. The programmable device of claim 18, wherein

(a) said step of performing an action execution response obtains an action type indicator from an action definition,

thereby helping to solve the Sequenced Action Problem,

and thereby providing a practical means for identifying single actions and group actions as part of said action execution response.

25. The programmable device of claim 18, wherein

(a) said step of performing an action execution response executes an action whose type is selected from the group consisting of single actions and group actions,

thereby helping to solve the Sequenced Action Problem,

and thereby providing a practical means for executing single actions and group actions as part of said action execution response.

26. The programmable device of claim 18, wherein

(a) said step of performing an action execution response uses action data read from an action data storage means to perform said action execution response,

thereby helping to solve the Collection Extensible Action GUI Problem, and the Customized Action Problem, and the Sharable Action Problem, and the Scalable Action Storage Problem,

and thereby providing a practical means for obtaining action data to use during the performance of said action execution response.

27. The programmable device of claim 18, wherein

(a) said step of performing an action execution response uses action data read from a context-sensitive action data storage means to perform said action execution response,

thereby helping to solve the Collection Extensible Action GUI Problem, and the Customized Action Problem, and the Sharable Action Problem, and the Scalable Action Storage Problem,

and thereby providing a practical means for obtaining in a context-sensitive way action data to use during the performance of said action execution response.

28. The programmable device of claim 18, wherein

(a) said step of performing an action execution response executes a single action,

thereby helping to solve the Collection Extensible Action GUI Problem,

and thereby providing a practical means for executing single actions as part of said action execution response.

29. The programmable device of claim 18, wherein

(a) said step of performing an action execution response executes a group action,

thereby helping to solve the Collection Extensible Action GUI Problem, and the Sequenced Action Problem,

and thereby providing a practical means for executing group actions and single actions as part of said action execution response.

30. The programmable device of claim 18, wherein

(a) said step of performing an action execution response executes a single action using a parallel execution technique,

thereby solving the Single Action Parallel Execution Problem,

and thereby providing a practical means for improving the execution performance of single actions executed as part of said action execution response.

31. The programmable device of claim 18, wherein

(a) said step of performing an action execution response executes a group action using a parallel execution technique,

thereby solving the Group Action Parallel Execution Problem,

and thereby providing a practical means for improving the execution performance of group actions executed as part of said action execution response.

32. The programmable device of claim 18, wherein

(a) said step of performing an action execution response uses zero or more focus

variable substitutions to construct an executable action command,

thereby solving the Parameterized Action Problem,

and thereby providing a practical means for inserting current parameter values into an action command template as part of said action execution response.

33. The programmable device of claim 18, wherein

(a) said step of performing an action execution response uses a dynamic list to construct an action dialog,

thereby solving the Dynamic List Generation Problem,

and thereby providing a practical means for inserting lists of current data values into an action dialog as part of said action execution response.

34. The programmable device of claim 18, wherein

(a) said step of performing an action execution response communicates action execution results to one or more destinations selected from the group consisting of computer memories and computer display screens and computer files and computer networks,

thereby helping to solve the Collection Extensible Action GUI Problem,

and thereby providing a practical means for displaying and storing action execution results as part of said action execution response.

35. A computer readable memory, encoded with data representing a Collection Extensible Action GUI program that can be used to direct a computer when used by the computer, comprising:

(a) means for receiving an action execution request, and

(b) means for performing an action execution response to said action execution request,

thereby providing a solution to the Collection Extensible Action GUI Problem, and

thereby providing human users with a practical means for extending the functionality of graphical user interfaces in a way that was not previously possible.

36. The computer readable memory of claim 35, wherein

(a) said means for receiving an action execution request receives an action request from a source selected from the group consisting of human operators and external programs and a GUI program that is executing said step of receiving an action execution request,

thereby helping to solve the Collection Extensible Action GUI Problem, and

thereby providing GUI interfaces with a practical means for responding to action execution requests that originate from both inside and outside the GUI program.

37. The computer readable memory of claim 35, wherein

(a) said means for performing an action execution response obtains an action identifier from said action execution request,

thereby helping to solve the Collection Extensible Action GUI Problem, and

thereby providing a practical means for clearly identifying a particular action to be executed as part of said action execution response.

38. The computer readable memory of claim 35, wherein

(a) said means for performing an action execution response uses an action identifier, and action data read from an action data storage means, to perform a name matching operation to identify an action definition to be executed,

thereby helping to solve the Collection Extensible Action GUI Problem, and the Customized Action Problem, and the Sharable Action Problem, and the Scalable Action Storage Problem,

and thereby providing a practical means for identifying a particular action definition to be executed as part of said action execution response.

39. The computer readable memory of claim 35, wherein

(a) said means for performing an action execution response uses action definition data read from an action data storage means to perform said action execution response,

thereby helping to solve the Collection Extensible Action GUI Problem, and the Customized Action Problem, and the Sharable Action Problem, and the Scalable Action Storage Problem,

and thereby providing a practical means for obtaining an action definition to be executed as part of said action execution response.

40. The computer readable memory of claim 35, wherein

(a) said means for performing an action execution response uses action definition data read from a context-sensitive action data storage means to perform said action execution response,

thereby helping to solve the Collection Extensible Action GUI Problem, and the Customized Action Problem, and the Sharable Action Problem, and the Scalable Action Storage Problem,

and thereby providing a practical means for obtaining in a context-sensitive way an action definition to be executed as part of said action execution response.

41. The computer readable memory of claim 35, wherein

(a) said means for performing an action execution response obtains an action type indicator from an action definition,

thereby helping to solve the Sequenced Action Problem,

and thereby providing a practical means for identifying single actions and group actions as part of said action execution response.

42. The computer readable memory of claim 35, wherein

(a) said means for performing an action execution response executes an action whose type is selected from the group consisting of single actions and group actions,



thereby helping to solve the Sequenced Action Problem,

and thereby providing a practical means for executing single actions and group actions as part of said action execution response.

43. The computer readable memory of claim 35, wherein

(a) said means for performing an action execution response uses action data read from an action data storage means to perform said action execution response,

thereby helping to solve the Collection Extensible Action GUI Problem, and the Customized Action Problem, and the Sharable Action Problem, and the Scalable Action Storage Problem,

and thereby providing a practical means for obtaining action data to use during the performance of said action execution response.

44. The computer readable memory of claim 35, wherein

(a) said means for performing an action execution response uses action data read from a context-sensitive action data storage means to perform said action execution response,

thereby helping to solve the Collection Extensible Action GUI Problem, and the Customized Action Problem, and the Sharable Action Problem, and the Scalable Action Storage Problem,

and thereby providing a practical means for obtaining in a context-sensitive way action data to use during the performance of said action execution response.

43. The computer readable memory of claim 35, wherein

45. The computer readable memory of claim 35, wherein

(a) said means for performing an action execution response executes a single action,

thereby helping to solve the Collection Extensible Action GUI Problem,

and thereby providing a practical means for executing single actions as part of said action execution response.

46. The computer readable memory of claim 35, wherein

(a) said means for performing an action execution response executes a group action,

thereby helping to solve the Collection Extensible Action GUI Problem, and the Sequenced Action Problem,

and thereby providing a practical means for executing group actions and single actions as part of said action execution response.

47. The computer readable memory of claim 35, wherein

(a) said means for performing an action execution response executes a single action using a parallel execution technique,

thereby solving the Single Action Parallel Execution Problem,

and thereby providing a practical means for improving the execution performance of single actions executed as part of said action execution response.

48. The computer readable memory of claim 35, wherein

(a) said means for performing an action execution response executes a group action using a parallel execution technique,

thereby solving the Group Action Parallel Execution Problem,

and thereby providing a practical means for improving the execution performance of group actions executed as part of said action execution response.

49. The computer readable memory of claim 35, wherein

(a) said means for performing an action execution response uses zero or more focus variable substitutions to construct an executable action command,

thereby solving the Parameterized Action Problem,

and thereby providing a practical means for inserting current parameter values into an action command template as part of said action execution response.

50. The computer readable memory of claim 35, wherein

(a) said means for performing an action execution response uses a dynamic list to construct an action dialog,

thereby solving the Dynamic List Generation Problem,

and thereby providing a practical means for inserting lists of current data values into an action dialog as part of said action execution response.

51. The computer readable memory of claim 35, wherein

(a) said means for performing an action execution response communicates action execution results to one or more destinations selected from the group consisting of computer memories and computer display screens and computer files and computer networks,

thereby helping to solve the Collection Extensible Action GUI Problem,

and thereby providing a practical means for displaying and storing action execution results as part of said action execution response.

Collection Extensible Action GUI Problem